Suisun Marsh Monitoring Program
Channel Water Salinity Report

Reporting Period: November 2012

Questions regarding this report should be directed to:

Michal Koller
California Department of Water Resources
Division of Environmental Services
3500 Industrial Blvd
West Sacramento, CA 95691

Telephone: (916) 376-9728
mkoller@water.ca.gov

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1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per the State Water Resources Control Board (SWRCB) Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions, the California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. Conditions of channel water salinity in the Suisun Marsh are determined by monitoring specific electrical conductivity, which is referred as "specific conductance" (SC). The locations of all listed stations are shown in Figure 5.

The monthly reports are submitted for October through May each year in accordance with SWRCB requirements. The reports are required to include salinity data from the stations listed below to ensure salinity standards are met to protect habitat for waterfowl in managed wetlands:

COMPLIANCE STATIONS:		
Station Identification	Station Name	General Location
C-2*	Collinsville	Western Delta
S-64	National Steel	Eastern Suisun Marsh
S-49	Beldon's Landing	North-Central Suisun Marsh
S-42	Volanti	North-Western Suisun Marsh
S-21	Sunrise	North-Western Suisun Marsh

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh:

MONITORING STATIONS:		
Station Identification	Station Name	General Location
S-97	Ibis	Western Suisun Marsh
S-35	Morrow Island	South-Western Suisun Marsh

* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates are also included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

2. MONITORING RESULTS

2.1 Channel Water Salinity Compliance

During the month of November, salinity conditions at all five compliance stations were in compliance with channel water salinity standards (Table 1). Compliance with standards for the month was determined for each compliance station by comparing the progressive daily mean (PDM) of high tide SC with respective standards. The standard for compliance stations C-2, S-64, and S-49 was 15.5 mS/cm and for stations S-21, and S-42 the standard was 16.5 mS/cm for November 2012. The progressive daily mean is the monthly average of both daily high tide SC values. The mathematical equation is shown below:

$$PDM = \frac{\sum \text{daily average of high tide SC}}{\text{\# days in the month}}$$

2.2 Delta Outflow

Outflow for November 2012 ranged between 3,400 cfs and 11,600 cfs (Figure 3). For the month, outflow began at 3,900 cfs and increased to 11,600 cfs in response to a series of precipitation events. The month ended with outflow at 4,800 cfs. The monthly Delta outflow is represented by the mean Net Delta Outflow Index (NDOI). The NDOI is the estimated daily average of Delta outflow. Mean NDOI for November 2012 is listed below:

Month	Mean NDOI (cubic feet per second)
November	5,900

2.3 Precipitation

Precipitation for the month totaled 4.75 inches. Precipitation events occurred on the following dates: November 1st, November 8th, November 15th, November 20th and November 29th. The majority of the precipitation, 2.03 inches, occurring on November 29-30th. This data was recorded at the Fairfield Water Treatment Plant. The monthly total precipitation is below:

Month	Total Precipitation (inches)
November	4.75

2.4 Suisun Marsh Salinity Control Gates Operations

Operations and flashboard/boat lock installations at the Suisun Marsh Salinity Control Gates (SMSCG) during November 2012 are summarized below:

Date	Gate Status	Flashboards Status	Boat Lock Status
November 1-27	3 Tidally Operating	In	Partially Closed
November 28-30	3 Open	In	Partially Closed

The radial gates were taken out of tidal operation on November 28th due to the wet conditions of November. Operations will be monitored for any changes in salinity.

Boat lock gates are partially closed due to ongoing investigation on safety concerns expressed by DFD staff. NOAA was briefed about the safety concern and will schedule a field visit to assess options with DWR to balance fish needs and safety needs.

3. DISCUSSION

3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- Delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,
- operations of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions During the Reporting Period

During November 2012, PDM salinity levels at Collinsville (C-2), National Steel (S-64), Beldon's Landing (S-49), Sunrise Club (S-21) and Volanti (S-42) ranged between 8.46 mS/cm and 10.71 mS/cm as shown in Figure 1. For the month of November, salinity levels at all stations stayed relatively flat.

Salinity levels at monitoring stations Morrow Island (S-35) and Ibis (S-97) are shown in Figure 2. Both stations show a gradual decrease in salinity for the month.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high tide SC at the compliance and monitoring stations for November 2012 were compared with means for those months during the previous nine years (Figure 4).

November's mean salinity pattern for all compliance and monitoring stations ranked second in lowest salinity levels for the past 10 years. The pattern followed that of 2004 but at a slightly lower salinity level. As expected, the salinity levels gradually increased from east to west.

Table 1: Monthly Mean High Tide Specific Conductance at Suisun Marsh Water Quality Compliance Stations November 2012

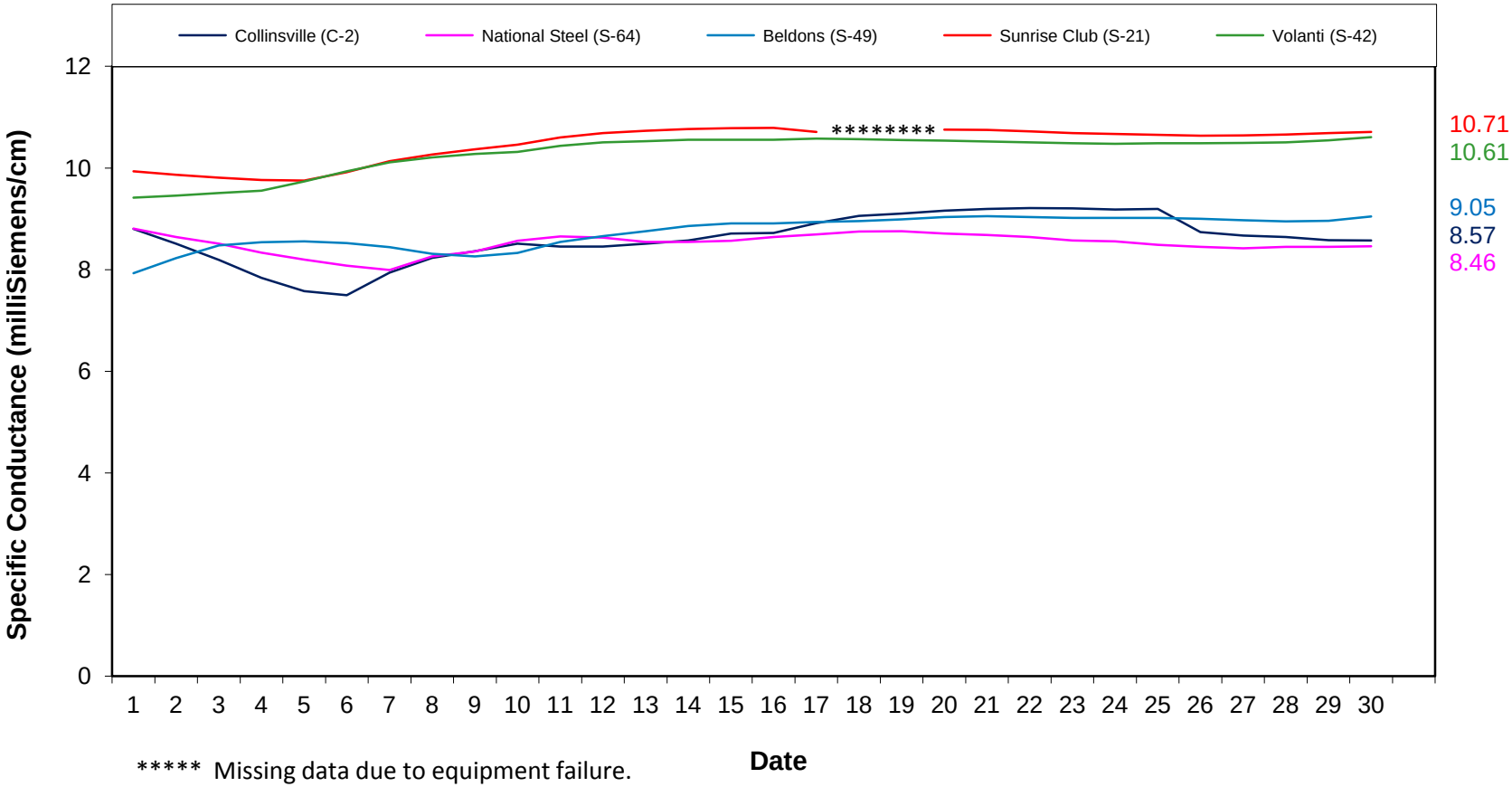
Station Identification	Specific Conductance (mS/cm)*	Normal Standard	Normal Standard Met?
C-2**	8.57	15.5	Yes
S-64	8.46	15.5	Yes
S-49	9.05	15.5	Yes
S-42	10.61	16.5	Yes
S-21	10.71	16.5	Yes

*milliSiemens per centimeter

**The representative data from nearby USBR station is used in lieu of data from station C-2.

Figure 1: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance for Compliance Stations November 2012

Standard = 15.5 mS/cm



***** Missing data due to equipment failure.

Figure 2: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance for Monitoring Stations November 2012

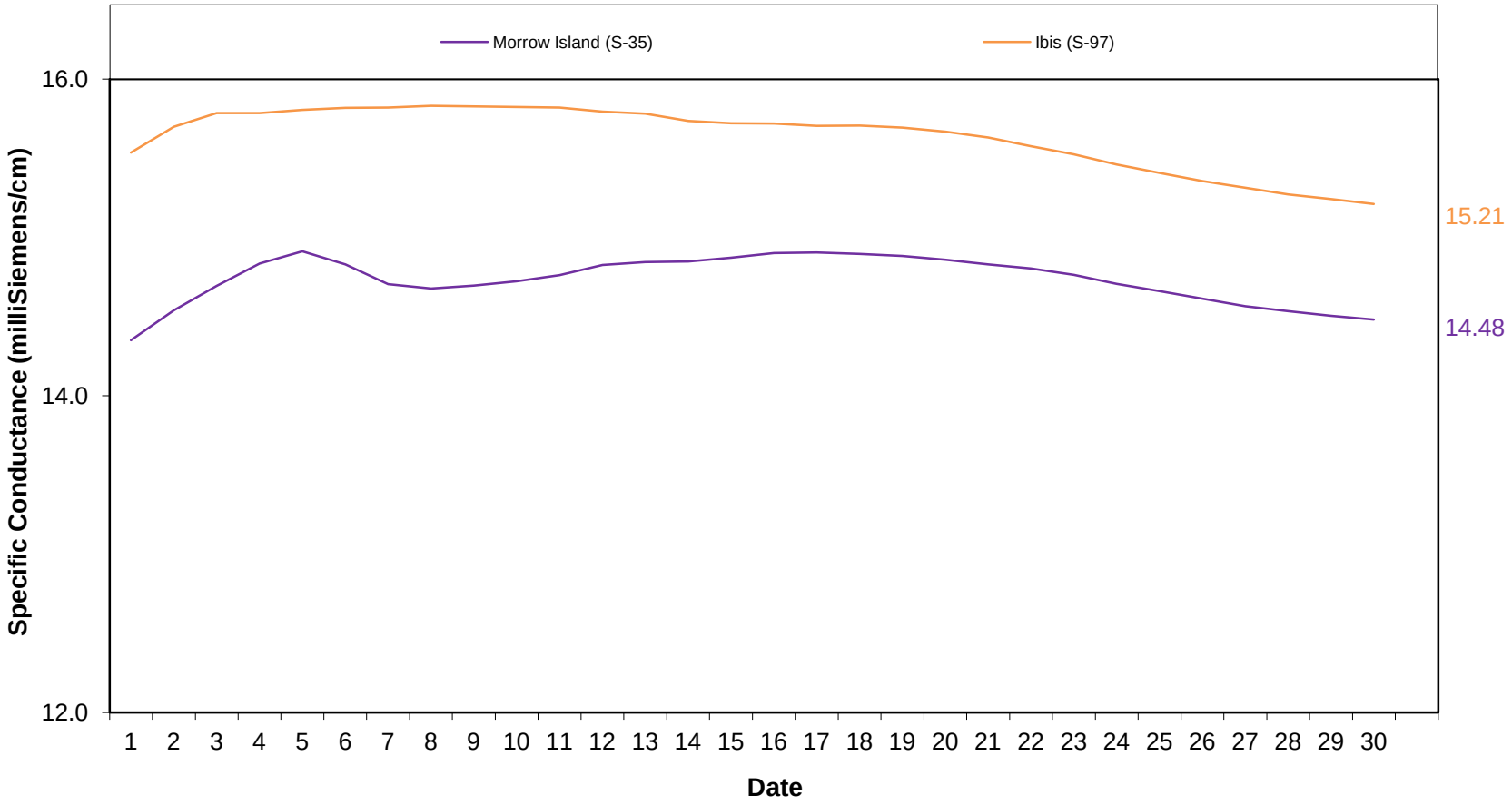
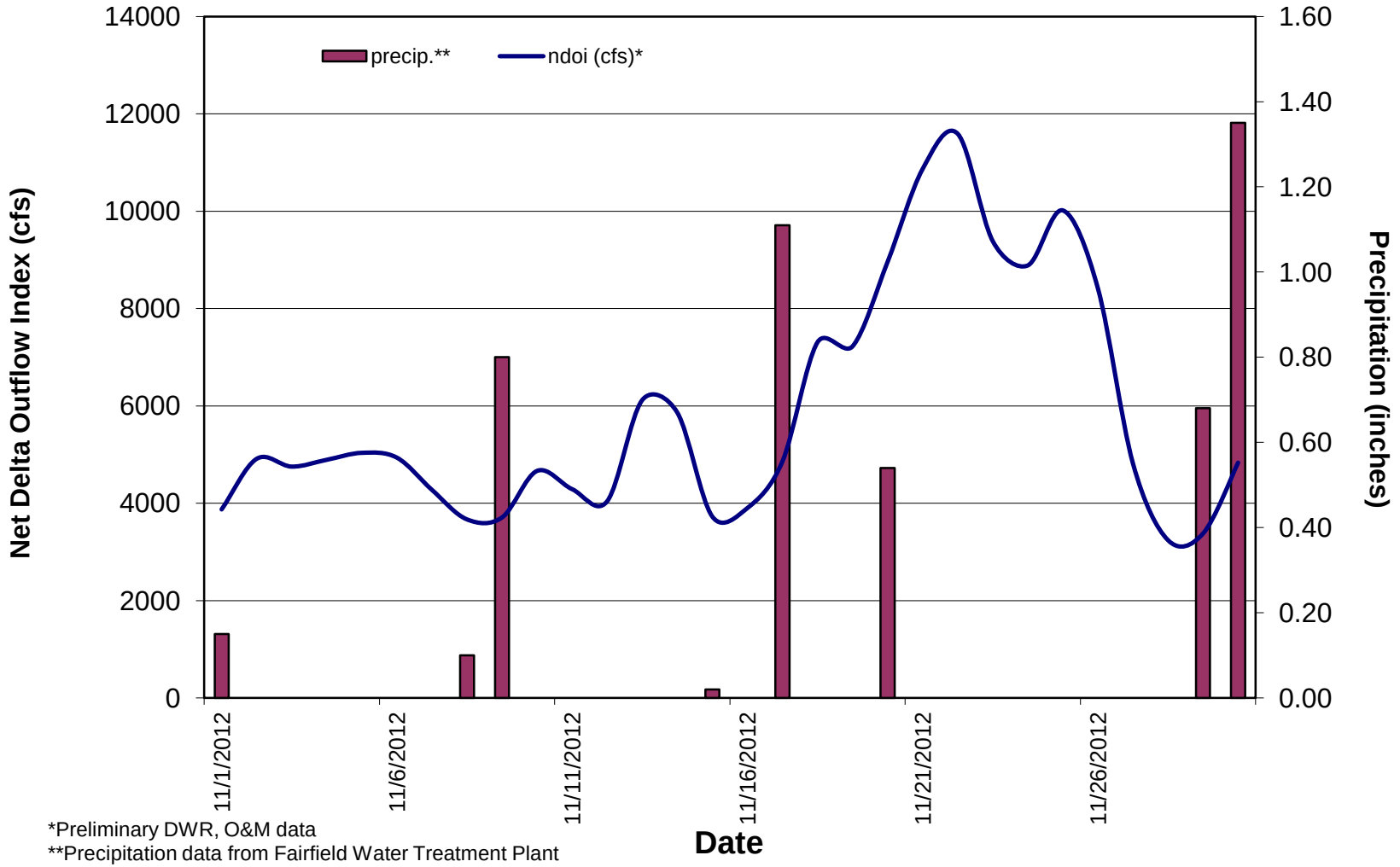
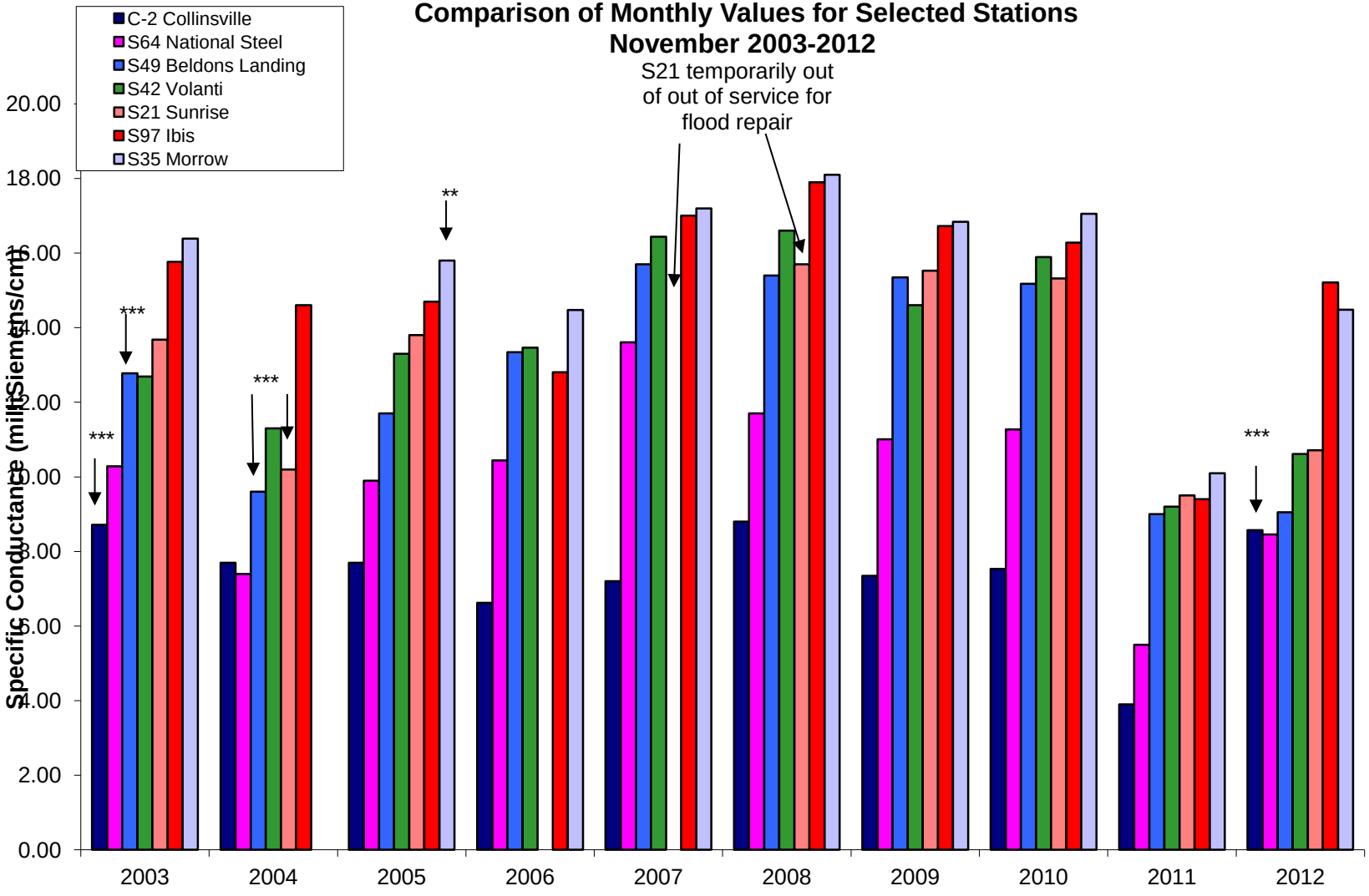


Figure 3: Daily Net Delta Outflow Index and Precipitation
November 2012



*Preliminary DWR, O&M data
**Precipitation data from Fairfield Water Treatment Plant

Figure 4. Monthly Mean Specific Conductance at High Tide: Comparison of Monthly Values for Selected Stations November 2003-2012



Note that certain stations do not reflect the actual end pdm.
** Data was not obtained due to powder problems at the station.
*** Some data not obtained due to equipment malfunction.

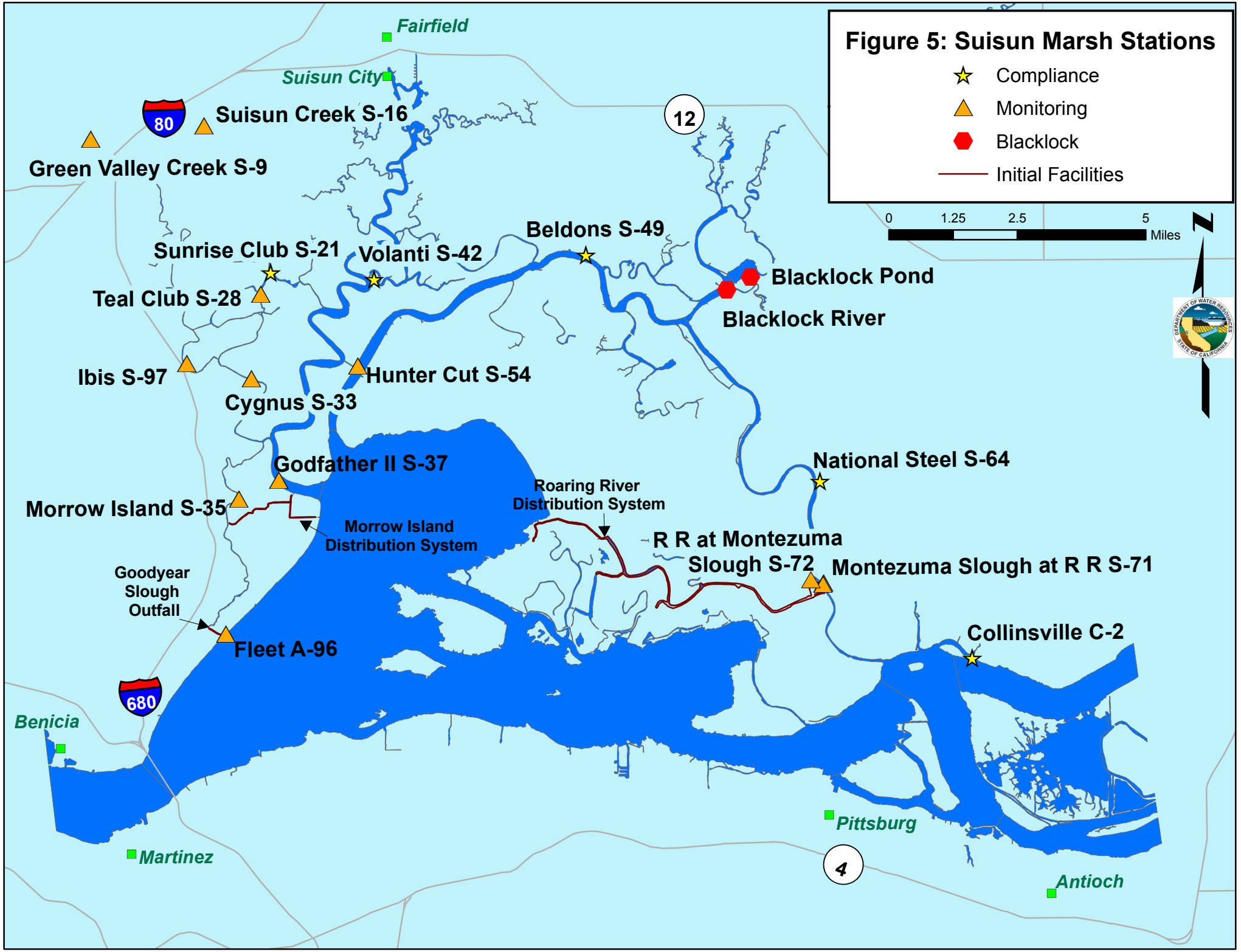


Figure 5: Suisun Marsh Stations
Compliance
Monitoring
Blacklock
Initial Facilities
0
1.25
2.5
5
Miles
Fairfield
Suisun City
Suisun Creek S-16
Green Valley Creek S-9
Sunrise Club S-21
Volanti S-42
Beldons S-49
Blacklock Pond
Blacklock River
Teal Club S-28
Ibis S-97
Hunter Cut S-54
Cygnus S-33
Godfather II S-37
National Steel S-64
Roaring River
Distribution System
Morrow Island S-35
Morrow Island
Distribution System
R R at Montezuma
Slough S-72
Montezuma Slough at R R S-71
Goodyear
Slough
Outfall
Fleet A-96
Collinsville C-2
Benicia
Pittsburg
Martinez
Antioch
80
12
680
4